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Ruffa

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[54] **FIBER OPTIC SOUND VELOCITY PROFILER**

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[52] **U.S. Cl.** **367/128**; 367/131; 367/902

[58] **Field of Search** 367/131, 128, 367/89, 91, 902; 356/28.5

[56] **References Cited**

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[57] **ABSTRACT**

A fiber optic cable, coated to increase its sensitivity to acoustic pressure, is towed through a medium. The optical fiber contains Bragg grating sensors at regular intervals along its length. A steerable array of transducers sends a pulse of sound in the direction of the optical cable while broadband pulses of light are directed down the optical fiber. The pulses of light are selectively reflected back according to the spacing between the Bragg gratings. The sound pressure field causes a local strain in the fiber, thus changing the grating spacing. The sound velocity profile along the length of the optical cable is computed by measuring the amount of time necessary for successive Bragg gratings to respond to the acoustic pressure associated with the advancing wave front of the acoustic pulse.

10 Claims, 1 Drawing Sheet